

Borehole

50-08-09**Log Event A****Borehole Information**

Farm : <u>T</u>	Tank : <u>T-108</u>	Site Number : <u>299-W10-112</u>
N-Coord : <u>43,452</u>	W-Coord : <u>75,787</u>	TOC Elevation : <u>671.76</u>
Water Level, ft : <u>118.2</u>	Date Drilled : <u>7/31/1973</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.250</u>	ID, in. : <u>4</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>121</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>121</u>	

Cement Bottom, ft. : 121 Cement Top, ft. : 0

Borehole Notes:

Borehole 50-08-09 was originally drilled in July 1973 to a depth of 87 ft and completed with 6-in. casing. The borehole was deepened to 121 ft in March and April 1977. The drilling log and Chamness and Merz (1993) are not detailed enough to determine exactly how the borehole was deepened. However, the drilling log notes perforated casing from 0 to 20 ft and 82 to 121 ft, followed by "sitting" a 4-in. pipe. On the basis of this information and field observations, it appears that the 6-in. casing was driven to 121 ft and a 4-in.-diameter casing was installed within the 6-in. casing. The annular space between the two casings was probably then grouted. This is typical of the practices used at other T Tank Farm boreholes.

Equipment Information

Logging System : <u>1B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1997</u>	Calibration Reference : <u>GJO-HAN-14</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>05/07/1998</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>61.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>05/08/1998</u>	Logging Engineer: <u>Gary Lekvold</u>
Start Depth, ft.: <u>119.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>72.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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50-08-09**Log Event A**

Log Run Number :	<u>3</u>	Log Run Date :	<u>05/11/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>73.5</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>60.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

Borehole 50-08-09 was logged in three runs. The total logging depth achieved by the SGLS was 119 ft. Spectra were collected at intervals of 0.5 ft using a 200-s counting time.

At the time of logging, there was water in the borehole at a depth of 118.2 ft.

Analysis Information

Analyst : D.L. ParkerData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 07/07/1998**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the field verification spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra.

A casing correction factor for a 0.50-in.-thick steel casing was applied to calculate the radionuclide concentration data during the analysis process. Although this correction factor does not match actual field conditions, it is probably the closest to the field conditions. Use of this casing correction factor will cause radionuclide concentrations to be undercalculated.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the apparent concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A time-sequence plot of selected gross gamma logs from 1980 to 1988 is included.

Results/Interpretations:

The man-made radionuclides Cs-137, Co-60, Eu-154, and Eu-152 were detected with the SGLS in this borehole. The Cs-137 contamination was detected continuously from the ground surface to 5 ft and 7 to 9.5 ft.



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The maximum apparent Cs-137 concentration of 1.04 pCi/g was measured at a depth of 1 ft.

Co-60 contamination was detected continuously from 64.5 to 87 ft. The maximum apparent Co-60 concentration was recorded as 20.6 pCi/g at a depth of 76.5 ft.

Eu-154 contamination was detected only at a depth of 66 ft at an apparent concentration of 0.4 pCi/g. Eu-152 contamination was detected only at a depth of 78 ft at an apparent concentration of 0.2 pCi/g.

Apparent K-40 concentrations increase from a background of about 8 to 10 pCi/g above 38 ft to about 13 pCi/g below this depth. The K-40 concentrations decrease below about 50 ft. The KUT concentrations increase gradually from about 56 to 75 ft. The Th-232 concentrations increase below about 80 ft and the KUT concentrations decrease sharply at about 91 ft.